

CLAIMS

What is claimed is:

1. An occupant classification system for a motor vehicle of the type having one or more occupant seats and an inflatable restraint system for providing impact protection for an occupant of the seat, the occupant classification system classifying an occupant of the seat as a function of certain types of occupants occupying the seat, the occupant classification system comprising:

an array of electrical switches positioned between a seat trim of the seat and a reactive surface, the switches producing selective outputs signals as an engaging surface of the seat makes contact with one or more of the switches when the occupant occupies the seat, the output signals being interpreted into a control signal to distinguish between occupants for controlling the inflatable restraint system; and

a control structure which defines a distance between the array switches and the engaging surface that is greater than zero when the seat is unoccupied so that the switches are insensitive to the initial forces applied to the seat through the seat trim, the distance between one or more of the switches and the engaging surface decreasing to zero when the occupant occupies the seat to produce the selective output signals.

2. The classification system of Claim 1 wherein the initial forces are the attachment forces applied to the trim covering the seat.

3. The classification system of Claim 1 wherein the array is divided into zones with at least one of the switches in each of the zones.

4. The classification system of Claim 3 wherein the control signal is based upon the number of the switches activated in each of the zones.

5. The classification system of Claim 4 wherein the control signal is based upon the number of the zones having the switches which are activated.

6. The classification system of Claim 3 wherein the zones include at least a pair of outer lateral zones, and a center zone.

7. The classification system of Claim 6 wherein the center zone includes an inner substantially circular region and a pair of outer non-circular regions.

8. The classification system of Claim 3 wherein each zone is a discrete zone defined by one or more portions of the control structure.

9. The classification system of Claim 8 wherein the discrete zones establish and maintain different sensitivity levels for different areas of the seat.

10. The classification system of Claim 9 wherein the discrete zones enable the system to be less sensitive to certain loading conditions and profiles.

11. The classification system of Claim 1 wherein the switches are carried by an array mat.

12. The classification system of Claim 1 wherein the switches are positioned between a foam seat cushion and a seat suspension.
13. The classification system of Claim 1 wherein the control structure is a integral unit totally surrounding the array of switches.
14. The classification system of Claim 1 wherein the control structure is formed of a plurality of segments defining divided zones with at least one switch in each of the zones.
15. The classification system of Claim 1 wherein the reactive surface is defined by a portion of a reactive structure formed with the control structure as an integrated unit.
16. The classification system of Claim 1 wherein the control structure and the array of switches are formed as an integrated unit.
17. The classification system of Claim 1 wherein the array of switches and the seat cushion are formed as an integrated unit.
18. The classification system of Claim 1 wherein compressive forces produced by the seat trim are restrained by the control structure and not by the switches when the seat is unoccupied.

19. The classification system of Claim 18 wherein the compressive forces are restrained by both the control structure and one or more of the switches when the occupant occupies the seat.

20. The classification system of Claim 1 further comprising a load diffusion layer positioned between the seat trim and the array of switches.